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FAIRCHILD
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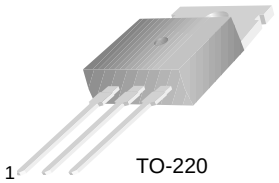
Jameco Part Number 179266

# TIP110/111/112

## Monolithic Construction With Built In Base-Emitter Shunt Resistors

- Complementary to TIP115/116/117
- High DC Current Gain : $h_{FE}$=1000 @ $V_{CE}$=4V, $I_C$=1A(Min.)
- Low Collector-Emitter Saturation Voltage
- Industrial Use




TO-220

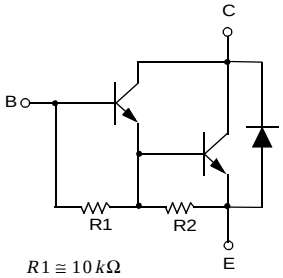
1.Base 2.Collector 3.Emitter

# NPN Epitaxial Silicon Darlington Transistor

## Absolute Maximum Ratings $T_C$=25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage : TIP110 | 60 | V |
| | : TIP111 | 80 | V |
| | : TIP112 | 100 | V |
| $V_{CEO}$ | Collector-Emitter Voltage : TIP110 | 60 | V |
| | : TIP111 | 80 | V |
| | : TIP112 | 100 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 5 | V |
| $I_C$ | Collector Current (DC) | 2 | A |
| $I_{CP}$ | Collector Current (Pulse) | 4 | A |
| $I_B$ | Base Current (DC) | 50 | mA |
| $P_C$ | Collector Dissipation ($T_a$=25°C) | 2 | W |
| | Collector Dissipation ($T_C$=25°C) | 50 | W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | - 65 ~ 150 | °C |

Equivalent Circuit




$R1 \cong 10\,k\Omega$
$R2 \cong 0.6\,k\Omega$

## Electrical Characteristics $T_C$=25°C unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| $V_{CEO}$(sus) | Collector-Emitter Sustaining Voltage | | | | |
| | : TIP110 | $I_C$ = 30mA, $I_B$ = 0 | 60 | | V |
| | : TIP111 | | 80 | | V |
| | : TIP112 | | 100 | | V |
| $I_{CEO}$ | Collector Cut-off Current | | | | |
| | : TIP110 | $V_{CE}$ = 30V, $I_B$ = 0 | | 2 | mA |
| | : TIP111 | $V_{CE}$ = 40V, $I_B$ = 0 | | 2 | mA |
| | : TIP112 | $V_{CE}$ = 50V, $I_B$ = 0 | | 2 | mA |
| $I_{CBO}$ | Collector Cut-off Current | | | | |
| | : TIP110 | $V_{CB}$ = 60V, $I_E$ = 0 | | 1 | mA |
| | : TIP111 | $V_{CB}$ = 80V, $I_E$ = 0 | | 1 | mA |
| | : TIP112 | $V_{CB}$ = 100V, $I_E$ = 0 | | 1 | mA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{BE}$ = 5V, $I_C$ = 0 | | 2 | mA |
| $h_{FE}$ | DC Current Gain | $V_{CE}$ = 4V, $I_C$ = 1A | 1000 | | |
| | | $V_{CE}$ = 4V, $I_C$ = 2A | 500 | | |
| $V_{CE}$(sat) | Collector-Emitter Saturation Voltage | $I_C$ = 2A, $I_B$ = 8mA | | 2.5 | V |
| $V_{BE}$(on) | Base-Emitter ON Voltage | $V_{CE}$ = 4V, $I_C$ = 2A | | 2.8 | V |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = 10V, $I_E$ = 0, f = 0.1MHz | | 100 | pF |

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# Typical Characteristics

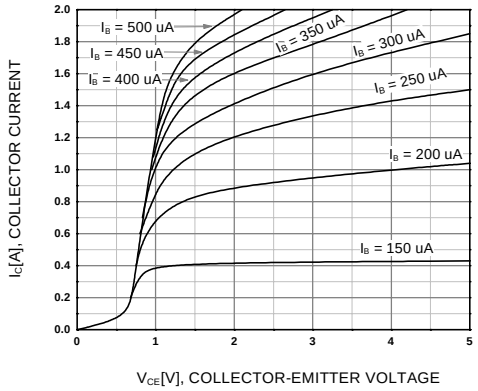


**Figure 1. Static Characteristic**

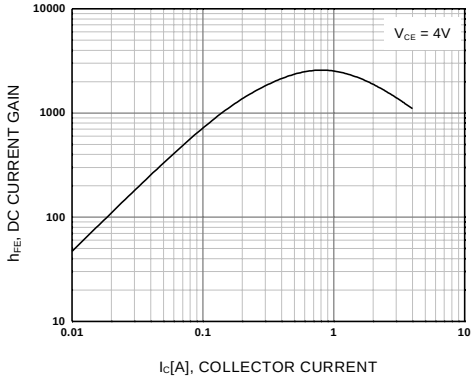


**Figure 2. DC current Gain**

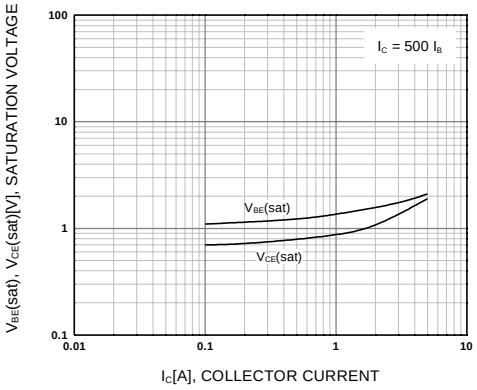


**Figure 3. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage**

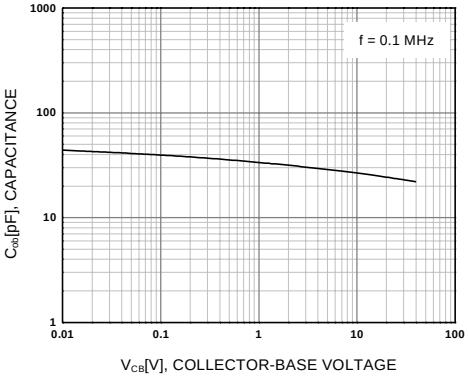


**Figure 4. Collector Output Capacitance**

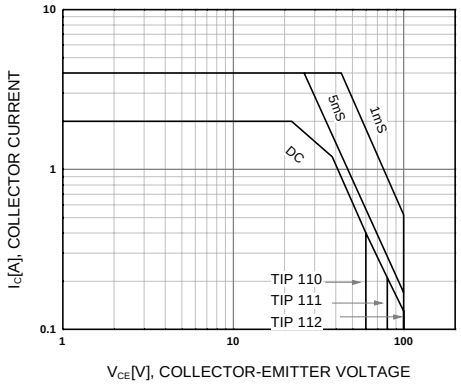


**Figure 5. Safe Operating Area**

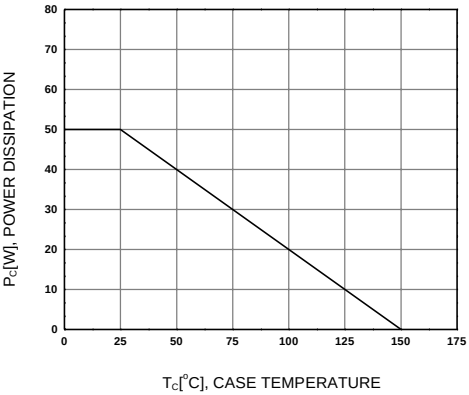


**Figure 6. Power Derating**

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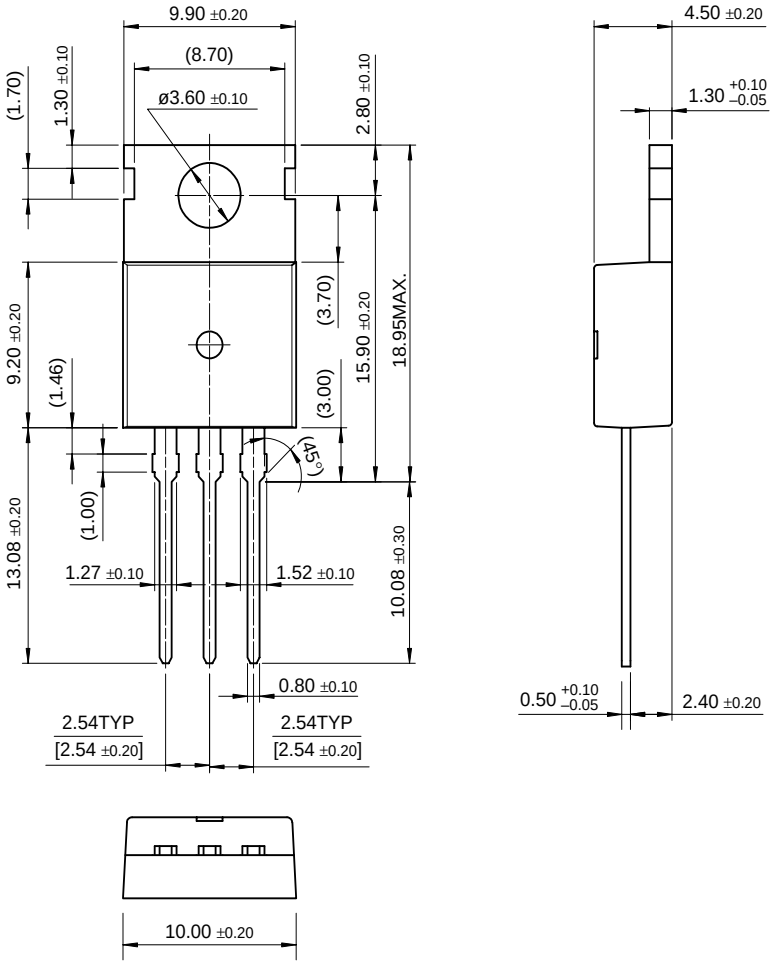
## Package Demensions

TO-220




Dimensions in Millimeters

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